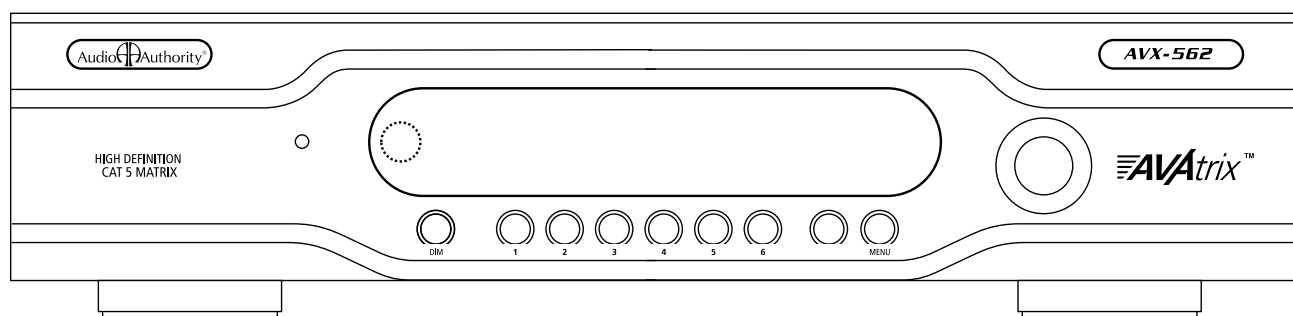


Installation and Operation



AVAtrix™

Model AVX-562
High Definition Cat 5 Matrix

Audio  Authority®

Installation and Operation Manual



Model AVX-562
High Definition Cat 5 Matrix

This document is consistent with features in firmware version 1.0

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Audio Authority® Corporation Lexington, Kentucky
www.audioauthority.com • 800-322-8346

AVX-562 Serial Number _____

Custom Installer _____

Telephone Number _____

Limited Warranty

If this product fails due to defects in materials or workmanship within one year from the date of the original sale to the end-user, Audio Authority guarantees that we will replace the defective product at no cost. Freight charges for the replacement unit will be paid by Audio Authority (Ground service only). A copy of the invoice from an Authorized Reseller showing the item number and date of purchase (proof-of-purchase) must be submitted with the defective unit to constitute a valid in-warranty claim.

Units that fail after the warranty period has expired may be returned to the factory for repair at a nominal charge, if not damaged beyond the point of repair. All freight charges for out-of-warranty returns for repair are the responsibility of the customer. Units returned for repair must have a Customer Return Authorization Number assigned by the factory.

This is a limited warranty and is not applicable for products which, in our opinion, have been damaged, altered, abused, misused, or improperly installed. Audio Authority makes no other warranties either expressed or implied, including limitation warranties as to merchantability or fitness for a particular purpose. Additionally, there are no allowances or credits available for service work or installation performed in the field by the end user.

Warnings

To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.



The exclamation point symbol alerts users to important operating and maintenance instructions in this booklet.

- Read this manual before installing or using this product.
- This product must be installed by qualified personnel.
- Do not open the cover—there are no user-serviceable parts inside.
- Do not expose this unit to excessive heat.
- Install only in dry, indoor locations.
- Do not obstruct the ventilation slots.
- Clean the unit only with a dry or slightly dampened soft cloth.

Specifications

Subject to change without notice.

Video Parameters

Signal Type	Component YPbPr
Video Formats	480i/p, 576i/p, 720p, 1080i/p
Input/Output Impedance	75 ohms
Input Ground Isolation	No
Gain	1
Gain Accuracy	2%
3dB Bandwidth	100MHz
Input Coupling	AC
S/N Ratio	61dB
Max Gain/Equalization	1

Audio Parameters

Format	Digital/Analog
Digital Input/Output Type	Optical+Coaxial In/Out
Input Impedance	75 ohms/50K ohms
Min Load Impedance	75 ohms/10K ohms
Multi-channel Digital	Yes
Frequency Response	10-50KHz
S/N Ratio	72dB
THD+Noise	0.03%
Crosstalk	75dB

Power

DC Input Connector	5.5 X 2.1mm
DC Input/Polarity	18V/Center positive
Power Supply	571-023
AVX-562 Heat Output	62 BTU/hr

Installation and Operation Manual



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Getting Started

- Register your purchase at www.audioauthority.com/register to activate your warranty and for future upgrade notification. Write the serial number (see AVAtrix rear panel) inside the back cover of this manual.
- Read these instructions.
- Unpack the AVX-562, assemble any expanders or accessories, and load batteries into the remote.
- Fabricate Cat 5 cables and use a professional network cable tester to test the cables.
- Connect associated equipment (see detailed instructions in the Installation Section).
- Connect the product to a suitable power outlet using only the power supply furnished.
- Perform desired setup operations; the AVAtrix PC Utility included on the flash card is recommended.



TIP: To access the menu, press MENU on the IR remote; or press and hold the knob, and touch the front panel MENU key.



TIP: To perform password protected operations, enter “2-3-6” on the front panel.

AVAtrix™ HD Cat 5 Matrix

The AVX-562 is a six input, seven output high definition matrix router. It has one local output and six Cat 5 remote outputs, all offering component video with digital and analog audio. The Model AVX-562 performs selection of up to six audio/video input sources by infrared control, RS-232 signals, or by manual selection. These inputs may be component video with digital and/or analog audio, all delivered to the viewer with their original vividness, brightness and clarity. Commercial venues, such as clubs and restaurants, as well as private homes can benefit by using the AVAtrix to send selectable video and/or audio to remote locations.

Three different Cat 5 wallplate/receiver styles are available (Models 9878, 9879 and 9880). The wallplate/receivers allow individual source selection by IR remote control; the output of each wallplate can also be controlled from the AVX-562 head end. The AVX-562 delivers component video, digital and analog audio to each wallplate/receiver over two Cat 5 cables. The AVAtrix is expandable up to 36 remote wallplate outputs by adding Model 1176 Cat 5 Matrix Expanders.

Carton Contents

- Model AVX-562 High Definition Cat 5 Matrix
- 18-volt power supply
- Model 1105BK infrared remote control with batteries
- Rack ears
- User manual
- Flash memory card with operational software and setup files (installed in AVX-562 flash card port)

Other Materials You May Need

- Patch cables (RCA, optical and 3.5mm)
- Infrared emitters and/or infrared remote control receivers—for remote wallplate/receiver IR functionality
- Cat 5e/6 cable—for remote outputs; consider buying a different jacket color for A and B cables
- RJ-45 plugs—for remote outputs; EZ RJ-45 plugs are recommended
- Professional network cable tester—continuity testing is not adequate for Cat 5 cables—twisted pairs must be properly matched for balanced line performance, so a tester capable of confirming pairs is required

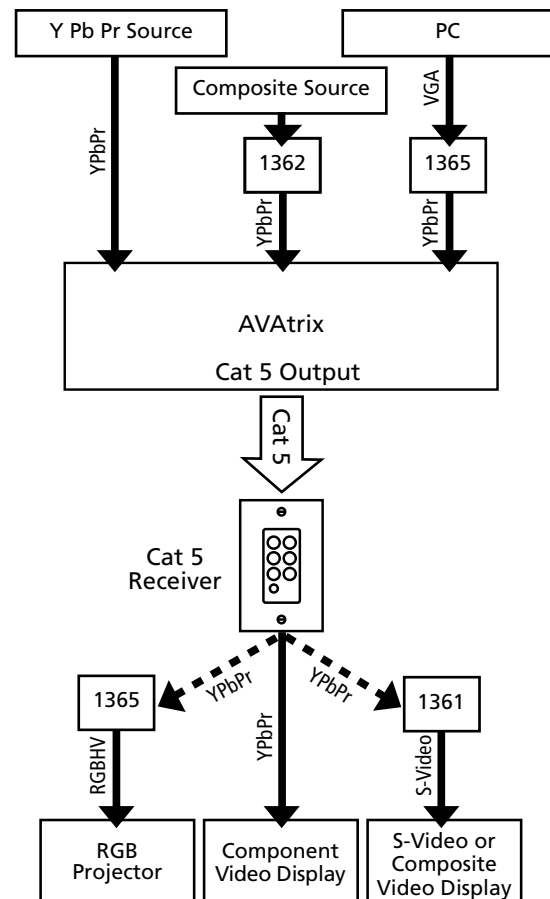


We strongly recommend testing factory-made cables as well as site-fabricated cables!

All cables must have proper EIA-568B pairing (**not crossover configuration**) for proper function. (The EIA-568A standard can also be used, but mixing the two standards could result in confusion.)

Suggested Audio Authority Accessories

- Model 1176BK High Definition Cat 5 Matrix Router: connects to internal bus cable to add six wallplate/receiver outputs the AVAtrix. Maximum 36 Cat 5 receiver outputs per system.
- Model 1172BK Audio Interface: provides an audio breakout point for the AVAtrix to connect an independent audio distribution system at the head end. Provides stereo analog audio or digital audio.
- Model 9878, 9879 or 9880 Cat 5 wallplate/receivers: any combination of Cat 5 receiver styles may be used in one system.
- Model 802-568 7-port bus cable: for up to 5 expanders or routers. (AVX-562 has Model 802-567 4-port bus cable installed at the factory—for up to 2 expanders or routers.)
- Model 1361 Down-converter/scaler: converts component video to composite video for legacy TVs.
- Model 1362 Up-converter/scaler: converts composite or S-video signals to component video for legacy video sources.
- Model 1365 Video Converter: converts YPbPr to RGBHV or VGA to YPbPr for incompatible video sources or projectors and video displays.



Video Converter Illustrations

Many possibilities exist for adapting or actively converting various signal types to work with the AVAtrix. Refer to the accessory descriptions above. Dotted lines show alternate configurations.

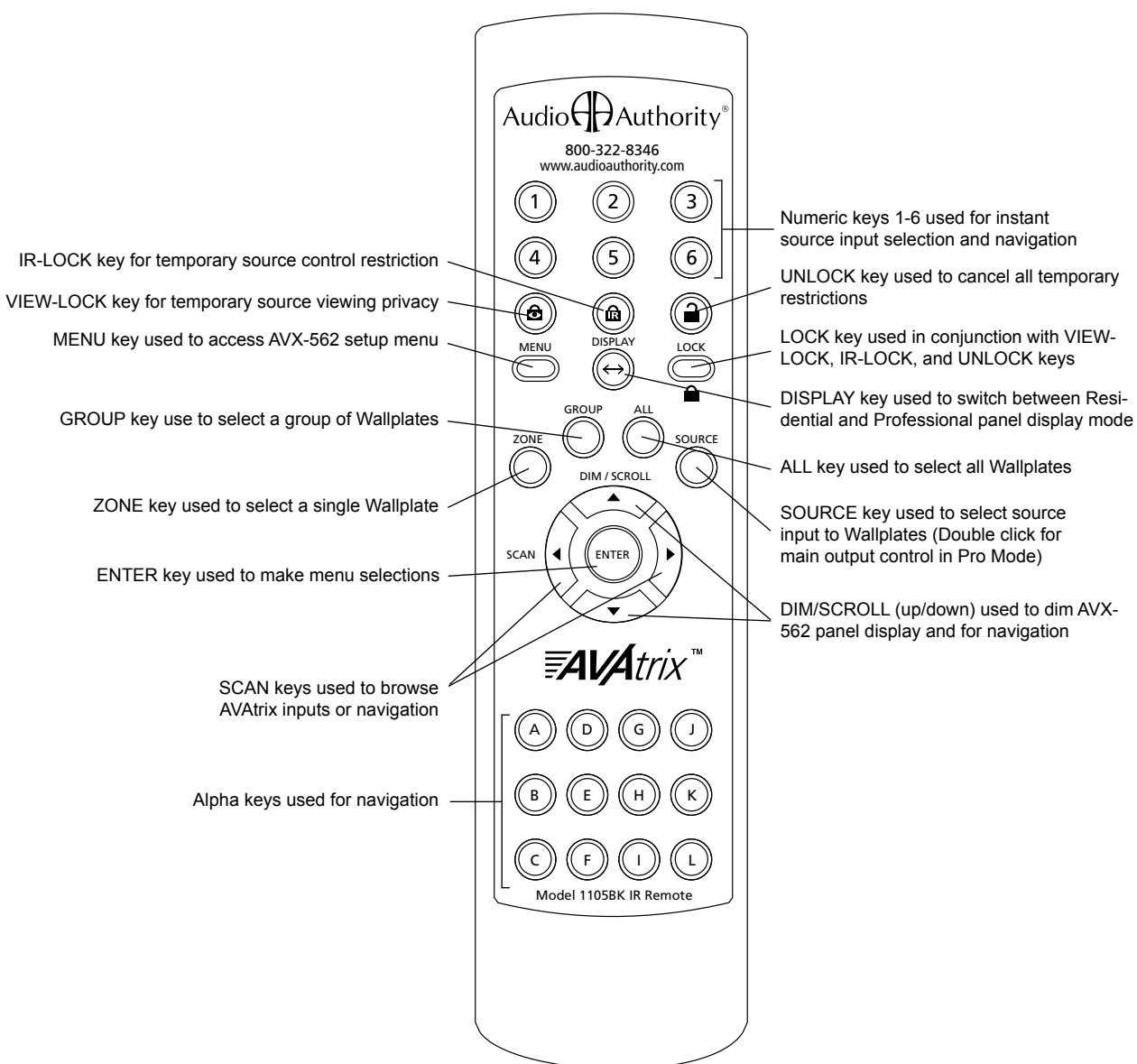
Panel Descriptions

Shown on the page opposite are the front and back views of the AVX-562. Below is a view of the 1105BK Infrared Remote Control. Each AVX-562 includes one 1105BK; additional 1105BK Remotes may be purchased separately, or you may download the IR codes from www.audioauthority.com.

Model 1105BK* IR Remote Control

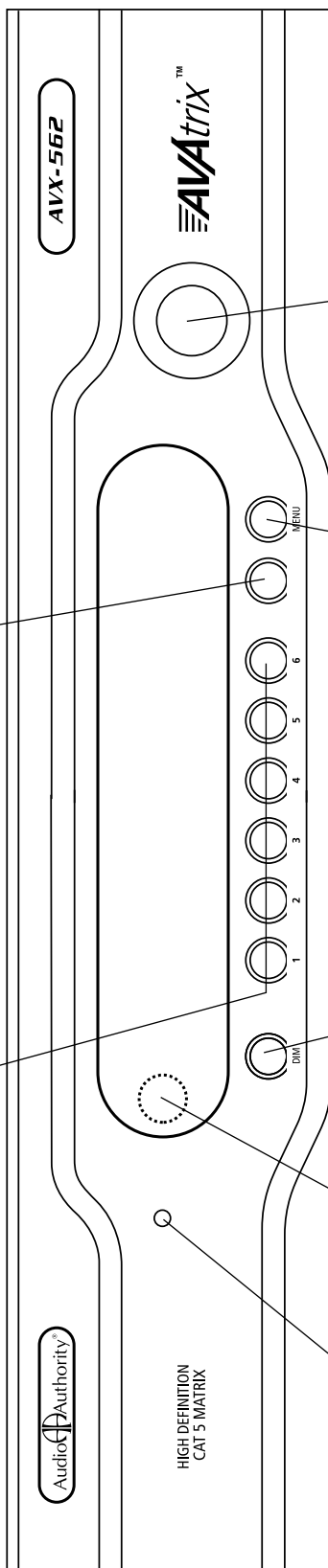
This full featured remote control is useful in basic AVAtrix installations for switching source signals to the main output, but it also can be used at any wallplate/receiver location to switch source signals to individual wallplate outputs. IR receiver and emitter required.

* The 1105BK is different from the Model 1105 only in appearance. Both units share exactly the same IR command set.



INPUT SELECTION
Press a key to switch the corresponding input to the main output; these keys are also used for setup

SOFT KEY
Performs the task indicated on the display (usually exit)



POWER LED
When lit, power is on

IR WINDOW
Receives IR commands

DIM
Press to dim the display (four brightness levels)

MENU KEY
Switches between Residential and Professional Modes, or touch while pressing the knob to enter the setup menu

NAVIGATION AND ENTER KNOB
Turn knob to navigate on-screen menus, press knob to enter (press and hold knob and touch MENU to enter setup mode)

DIGITALAUDIO INPUT
Optical OR coaxial inputs for position 1 (DO NOT connect both inputs from the same source)

IR ROUTER LED
Indicates IR traffic

IR ROUTER OUTPUT
Discrete IR signals from zone to selected source

LOCAL DIGITAL AUDIO OUTPUTS
All digital audio inputs are available at the coaxial and optical outputs

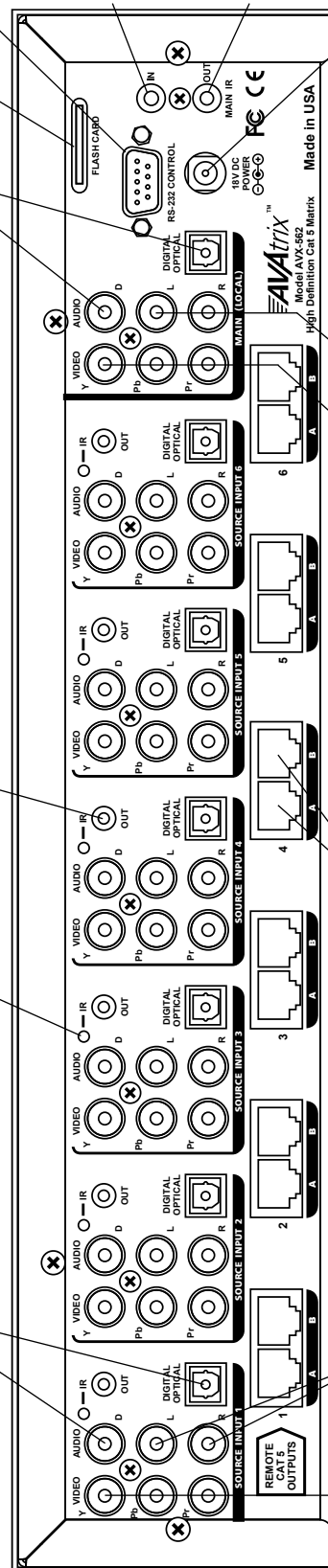
FLASH CARD PORT
Save and load setup files or use to upgrade firmware

RS-232 PORT
Control AVAtrix behavior using a serial control system

INFRARED IN
Control AVAtrix behavior using remote control signals

INFRARED OUT
Used only with compatible IR products (see Page 16)

POWER JACK
Use only the included 18V power supply



LOCAL COMPONENT VIDEO OUTPUT
Component video input signals are available on YPbPr jacks

LOCAL ANALOG AUDIO OUTPUT JACKS

CAT 5 OUTPUT
Connection for Cat 5 wallplate/receiver

ANALOG AUDIO INPUT

COMPONENT VIDEO INPUT
YPbPr input port for position 1

Installation

You may wish to consult with a qualified custom electronics installer if you are inexperienced with UTP cable termination and wiring. You should be familiar with Cat 5e/6 cable termination tools, testing, and techniques.

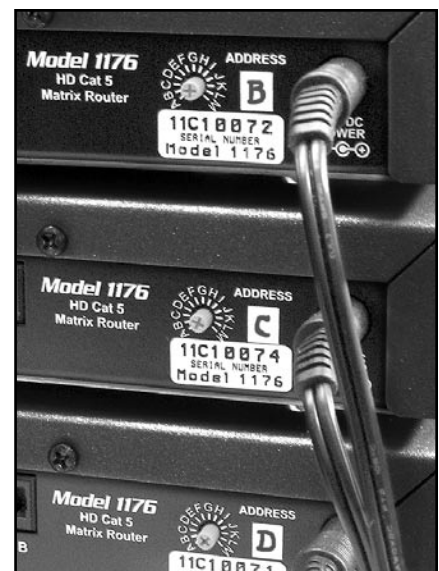
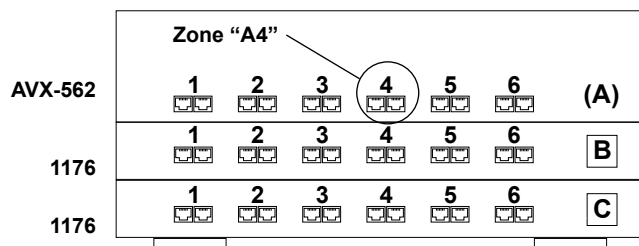
- 1. Assembling Expanders.** Follow these steps if you are installing Models 1172, 1176 or other expanders with your AVatrix. Refer to the diagram on the facing page. Otherwise, skip to Step 3.

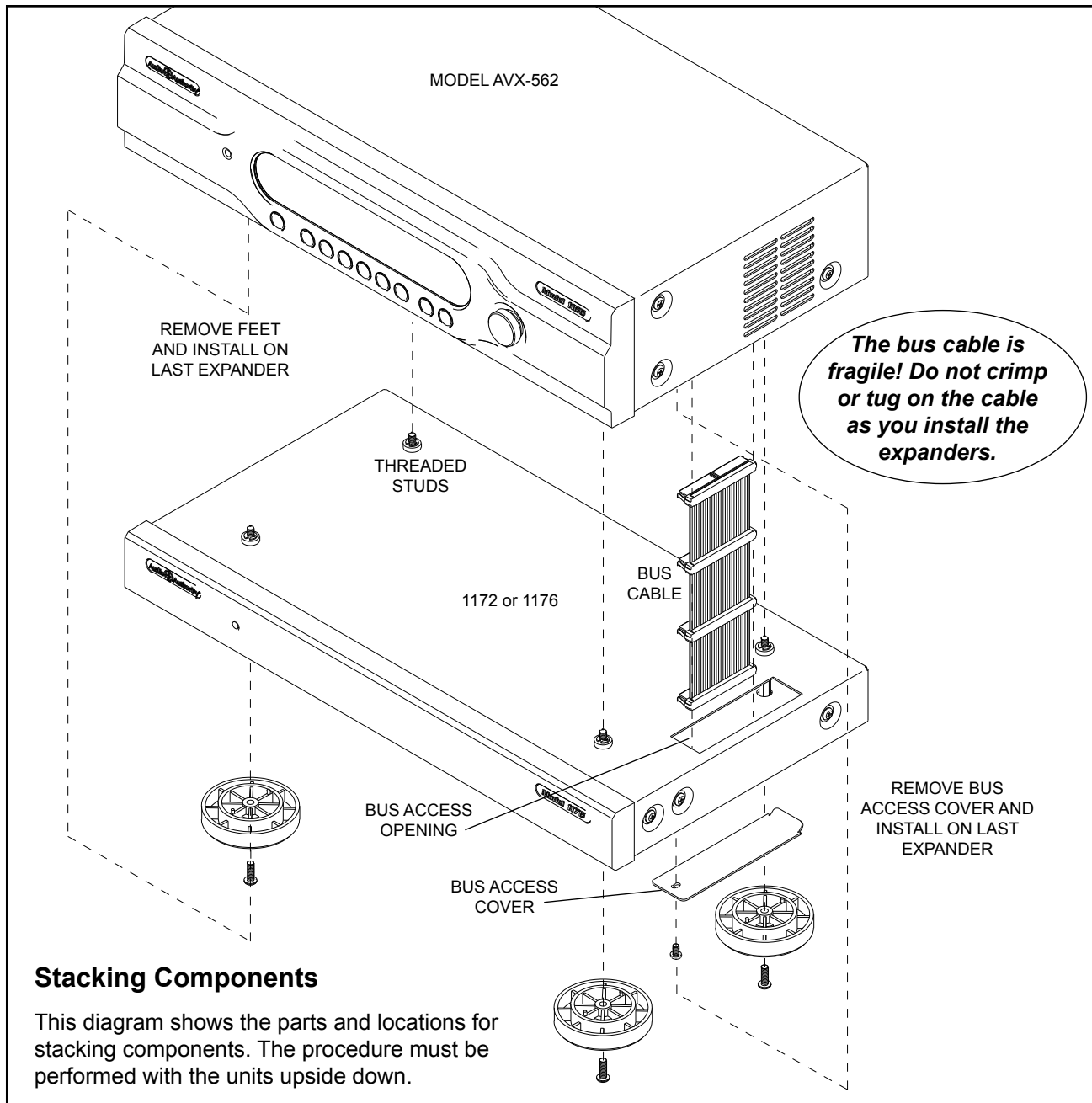
All video, audio, and communication signals between sources, Cat 5 outputs, and audio system outputs travel through the special ribbon bus cable. The AVatrix ships with a 4-port bus cable, leaving two open ports for expanders. If you need to add more than two expanders, call Audio Authority Technical Support.

- Lay the Model AVX-562 upside down on a protective surface, such as a terry cloth towel.
- Remove the four feet and the bus access covers (save them and their attaching screws).
- Gently feed the loose end of the bus cable out of the bus access opening. To upgrade from a four-port to a seven-port bus cable, call Audio Authority Technical Support.
- Plug the next connector into the port visible through the expander case opening—apply enough pressure with fingers or a plastic tool to assure that the plug is completely seated.
- Turn the next product to be stacked upside down (e.g. Model 1172 or 1176), thread the bus cable through its bus access openings, and engage its four threaded studs with the four threaded holes in the Model AVX-562 formerly occupied by the feet.
- Tighten the hex head screws in the bottom of the stacking product in sequence a few turns each, until they are all snug.
- Carefully plug the ribbon cable into the bus port. Continue this stacking procedure until all units have been assembled. View the bus through the bus port to be sure all plugs are fully seated.
- After plugging the last connector of the bus into the bottom unit, carefully tuck any excess cable into the empty space inside the unit. Be certain the back of the connector does not contact the metal case. To disconnect a bus plug, squeeze the side latches.
- Install the bus port cover and feet you removed from Model AVX-562 onto the bottom unit and turn the stack right side up.

2. Addressing and Initial Testing.

- Set the Address dial on each Model 1172 and/or 1176: set the upper-most Model 1176 address to “B”, the next one to “C”, and so on. The AVX-562 Cat 5 output row is permanently addressed “A”. Follow 1172 manual for addressing 1172.
- Temporarily plug in the power supplies of all units to a plug strip so that you can turn them all on at one time. The





opening screen on the Model AVX-562 display indicates that the unit is powered and shows the number of expanders that have been recognized. If this number is different from the number actually present, look for the bus not being fully plugged into a unit or a unit incorrectly addressed.

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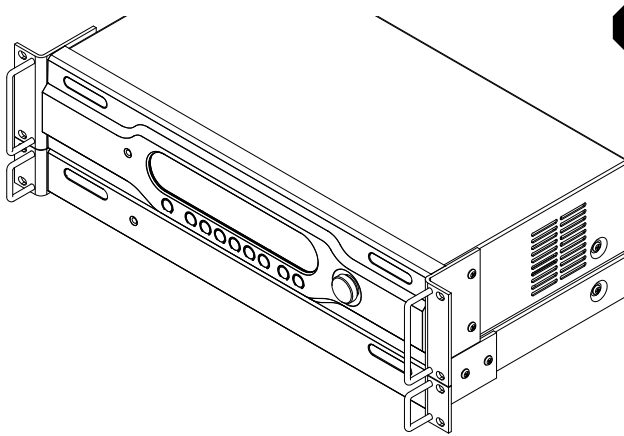
Audio Authority AVAtrix
Firmware Version 1.0
Software Copyright 2007, 2008
Recognized: (1) Internal CAT 5 Router
            (3) 1176 CAT 5 Expander(s)
            (0) 1170 CAT 5 Expander(s)

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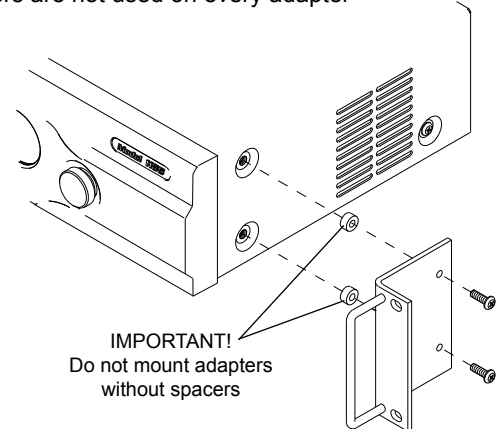
AVAtrix opening screen shows expanders recognized.

3. Rack Mount Adapters. Perform these steps if you are installing this product in a 19-inch equipment rack.

- a. Remove the cover screws adjacent to the front panel of each product and use them to mount Model 1192 (for Model AVX-562) or Model 1191 (for Model 1172/76) rack adapters. *Be sure to place a spacer under the adapters at every screw location – see illustration.*
- b. Use a straight edge to line up rack adapters on a stack of product before tightening the screws.



CAUTION! This product will be damaged if spacers are not used on every adapter screw.



4. Setting in Place. Place the AVAtrix on its shelf or in the rack. If rack mounting, secure it to the rails with the screws supplied with the rack adapter kits.

5. AVAtrix Hookup. Connect and test sources with the local video display in these steps.

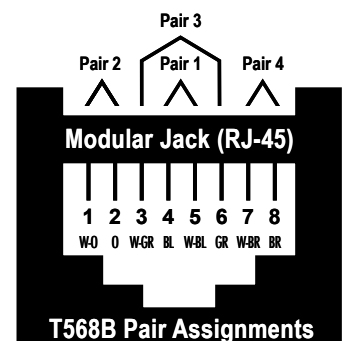
- a. Connect each source unit to its respective set of AVX-562 input jacks.
- b. Use high quality cable and keep the runs under 6 feet if possible, especially for component video connections.
- c. Connect either, but NOT BOTH optical and coaxial digital audio. Connect all the other signals available from the source unit: component video and analog audio.
- d. Connect a video display and audio system to the Local (Main) Output jacks. Use optical and/or coaxial digital audio outputs. The AVAtrix does not convert digital audio to analog audio, so connect analog audio to TV's inputs if required.
- e. Turn on the sources and AVAtrix temporarily for an initial test. Select each source to the local TV and sound system to verify basic functions. Remove power and continue installation.

6. Cat 5 Zone Connections.

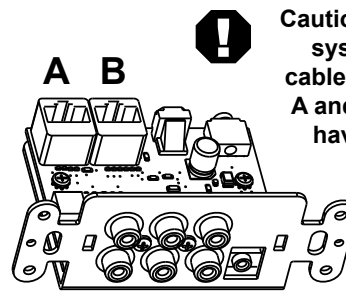
- a. Pull two lengths of good quality Category 5e or Cat 6 UTP cable from the main system to each receiver location. Shielded Cat 5 cable may be used, but offers no performance advantage.
- b. Carefully mark cables of each pair A and B; if they are connected incorrectly, damage to the wallplate/receiver may result. It is best to use a different cable jacket color, or label each end for A and B to ensure proper connection.
- c. Install RJ-45 plugs using EIA-568B pairing (pins 1-2, 3-6, 4-5, 7-8).



Check each cable with a **professional network cable tester** before plugging it into the AVAtrix, even when using pre-made cables. Continuity testing is not adequate! The twisted pairs must be properly matched for balanced line transmission.

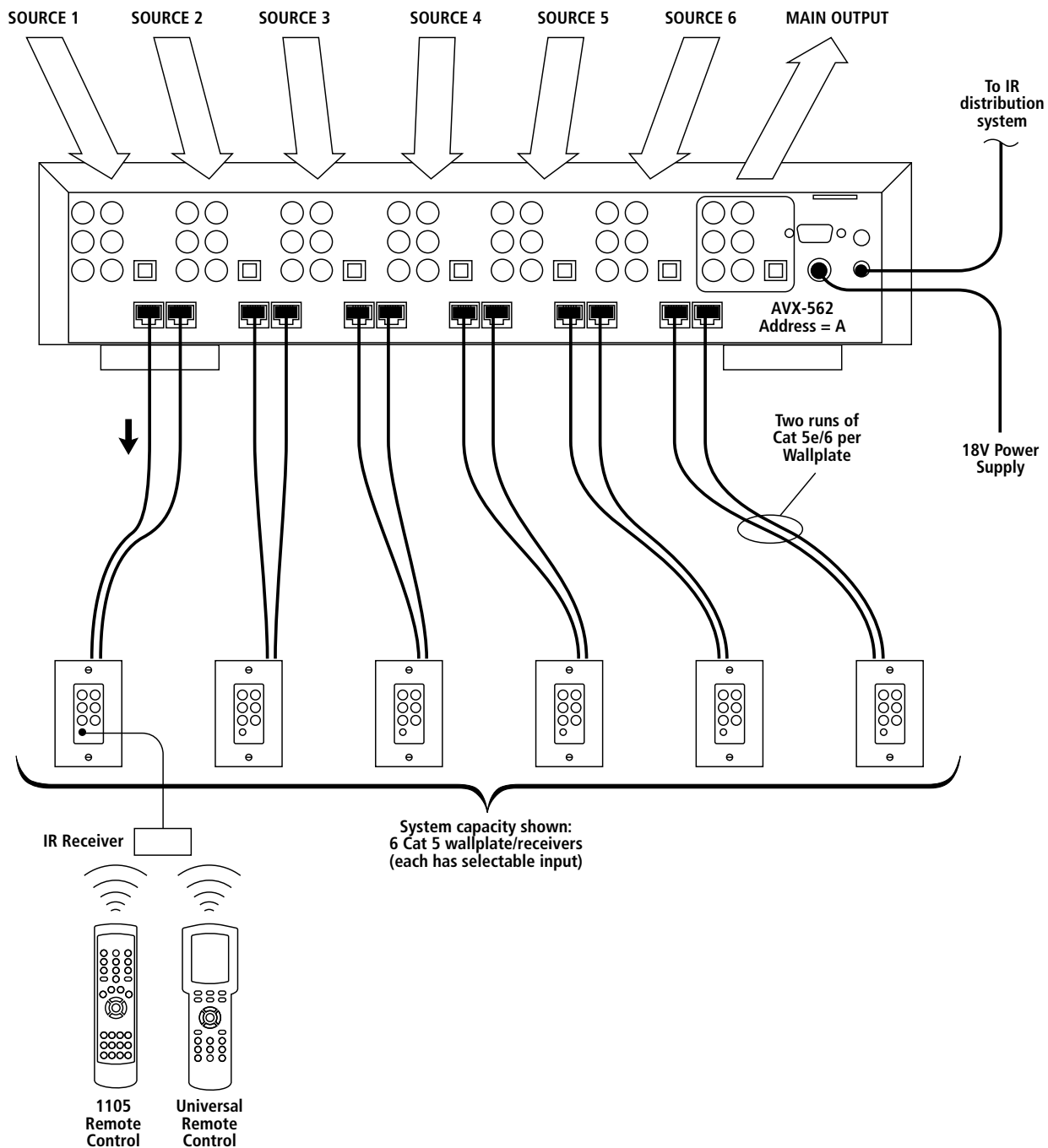


- d. Carefully plug the pairs of cables (A and B) into the correct A and B AVatrix output jacks.
- e. Connect cables to each wallplate/receiver. Be sure to plug cable A into jack A and cable B into jack B. Leave the wallplate Cable Length Compensation controls accessible until after zone testing.



Caution! Do not apply system power until cables are tested and A and B connections have been verified.

Basic AVatrix Wiring



- e. Adjust the Cable Length Compensation control on each wallplate/receiver according to the distance of that unit from the head end. Set the dial to the nearest number of hundreds of feet of cable distance (e.g. 200 feet = 2). During zone testing (see 7, below) it is recommended to use an HD source and display to fine tune each cable length compensation setting.

Note: Setting compensation too high or low may result in picture dropouts or distortion.

7. Zone Testing. Plug the power supply furnished with the AVAtrix and each expander into its respective unit, and plug the power supplies into a plug strip so that all units can be turned on at one time.

- a. Power indicators on the AVAtrix, all expander units and all installed wallplate/receivers should be on. If a wallplate power light does not come on, unplug the Cat 5 cables immediately and re-test them.



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Audio Authority AVAtrix
Firmware Version 1.0
Software Copyright 2007, 2008

Recognized: (1) Internal CAT 5 Router
            (3) 1176 CAT 5 Expander(s)
            (0) 1170 CAT 5 Expander(s)
```

- b. The opening screen on the AVAtrix panel indicates how many expanders have been recognized. The screen should match this illustration if a Model AVX-562 is installed with three 1176 expanders for a total output of 24 Cat 5 outputs.
- c. Apply power to all sources and video displays with associated equipment. Use the 1105BK remote control to verify video and audio signal integrity of sources at each zone location. Fine tune cable length compensation settings, then permanently mount each wallplate.

Remote Control Options

Four different remote control methods may be used with the AVAtrix:

- Native IR remote; Model 1105BK (Model 1105 IR codes are identical, but appearance is different).
- Comprehensive IR controllers can learn or download the AVAtrix IR codes.
- The local output can learn to respond to third party commands (see section 2 below). This feature does not apply to Cat 5 zone outputs.
- RS-232 commands. System controllers capable of RS-232 communication can be connected to the serial port on the AVAtrix. To program such controllers, refer to Appendix D in this manual.


1. Using AVAtrix IR Commands in Other Remote Controls. Comprehensive IR controllers can learn or download the AVAtrix IR codes along with the codes of the sources and can output a macro containing source controls and AVAtrix selection controls.

- a. If the 1105BK codes are available from your remote control company, download and/or activate those files.
- b. A CCF file containing 1105BK codes can be downloaded from the Audio Authority website: www.audioauthority.com/page/software
- c. As an alternative, follow the manufacturer's instructions to teach a learning remote control the numeric 1 through 6 commands from the 1105BK remote.

2. Teaching Infrared Commands to the AVAtrix for Local Control. An additional method of controlling the AVAtrix local (Main) output is to teach it commands from other brand remotes using the Learn IR Codes setup screen. This feature does not apply to remote Cat 5 zones. For instructions on the learning feature, call Audio Authority Technical Support.

Installing Infrared Equipment

1. Tips for Using Infrared Control.

-  a. If you are using standard hand-held remote controls, ensure correct operation by avoiding sources of light pollution such as Plasma and LCD TVs, direct sunlight, fluorescent light, etc. Experiment with the physical placement of the IR receiver to avoid interference.
- b. If a source of interference cannot be eliminated or avoided, use IR receivers that block that type of interference, such as Plasma-proof or LCD-proof receivers.
- c. Use the IR diagnostic tools to troubleshoot IR problems (See Appendix C).

NOTE: Due to variances in IR commands, carrier frequencies, and error tolerances between manufacturers, some sources may not be able to be controlled through the AVAtrix internal IR routing system.

- d. If you are using a comprehensive IR control system, provide a stick-on emitter or blaster from the infrared system to communicate through the AVAtrix front panel optical IR receiver. You can also patch the IR signal directly to the IR input port on the rear panel using a properly fabricated 3.5mm cable (see page 7). Call Audio Authority for more information.

2. Setting Up IR at the Remote Zones.

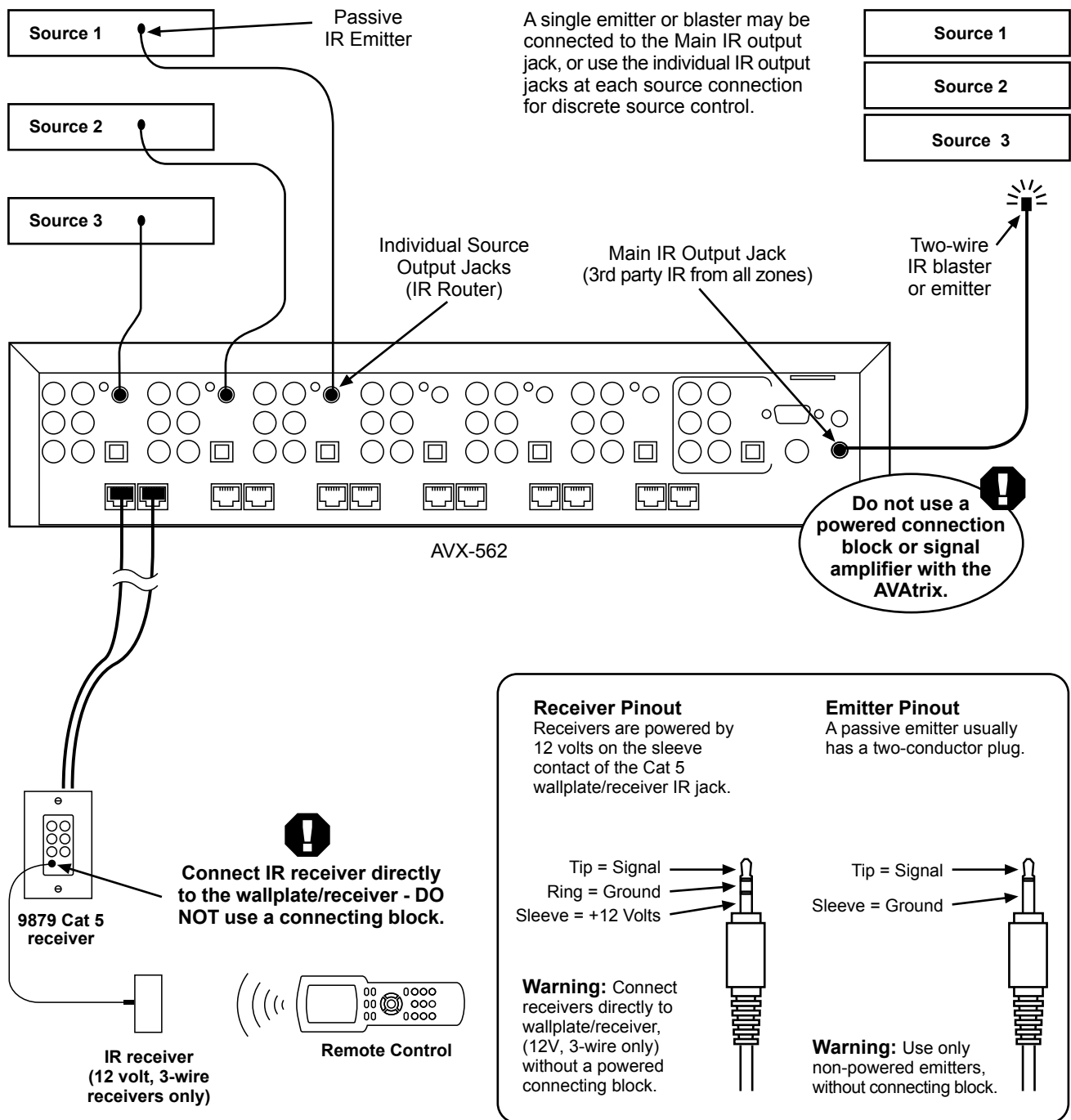
- a. Plug an Infrared Receiver into the 3.5mm jack on each wallplate/receiver that is to have IR source selection capability. (Use only compatible receivers without external power supply—see next page.)
- b. Infrared commands returned from a zone to the AVAtrix can immediately select the source to be played on that wallplate/receiver output. Use the IR routing connections, or the main IR output from the AVAtrix (see 3 below).
- c. IR commands for the AVAtrix (1105 commands) are returned through the Cat 5 cables and stop at the AVAtrix. Other IR commands are repeated on the AVAtrix IR output jacks.

3. IR Routing vs Main IR Output.

If all sources have different code sets, one IR blaster can be used to control all the sources in an equipment rack. If there are several sources that share identical IR codes, such as satellite receivers, individual IR emitters should be used for each source.

- a. IR Routing: To route IR commands discretely from an individual zone to the selected source only, connect IR emitters from the individual IR Out jacks at each AVAtrix source position to their respective source IR input jacks, or use a stick-on emitter. Other sources sharing the same IR code set are not affected.
- b. Main IR Output: Non-AVAtrix IR commands returned from all matrixed Cat 5 zones are repeated through the Main IR Output jack on the AVAtrix. This output can be used to feed commands from the zones to an external IR control system, or simply to an IR blaster. Do not use IR connecting blocks (see “Using Compatible Infrared Products” on page 16).
- c. Model 1170 IR capabilities: The AVAtrix cannot be directly controlled using the Cat 5 IR pathways from Model 1170. Model 1105 IR commands returned from wallplate/receivers connected to Model 1170 Cat 5 ports are repeated through the Main AVAtrix IR Output jack, but they perform no function within the AVAtrix.

Infrared Control Wiring



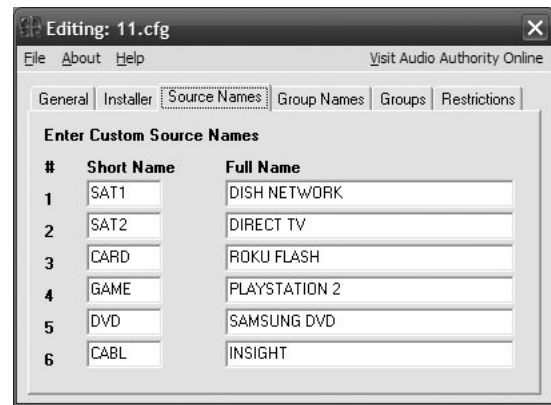
Using Compatible Infrared Emitters and Receivers

The AVAtrix has an active, 12 volt IR pathway that allows it to power the IR receivers at the zones, and drive emitters connected to the AVAtrix. Do not use powered IR systems that are designed to use a separate power source, or equipment damage could result. The AVAtrix powers IR receivers with 12 volts; do not use IR receivers designed for any other voltage. Use only three-wire receivers or damage could result.

Customizing the AVAtrix

Apply custom source names, create zone groups, apply parental controls, and lock out certain controls. Refer to the Setup Menu Chart on the next page for a complete list of custom options. It is recommended to save your custom setup to the flash card as a backup.

The easiest way to configure the system is to use the AVAtrix PC Utility (shown at the right); however, any configuration may be performed via the front panel controls and/or remote control. To use the PC Utility, see page 17.



Direct Setup

Setup via the front panel controls/IR remote is guided by on-screen prompts, so only highlights will be covered here. See the next page for a Setup Menu Map.

1. **General user tips.** Use the knob to navigate to each setup option, press the knob to select it, then follow on screen instructions. The IR remote may be more convenient for many setup tasks.
 - a. Setup Menu: Press MENU on the remote, or press and hold the knob and touch MENU.
 - b. Some of the operations are password protected. **The password is always “2-3-6”.**
 - c. The knob can be a multi-directional navigation tool on certain screens. Arrows in the upper right corner indicate the current direction on these screens. To change directions, push the knob.
 - d. Some screens offer editing tools such as change case, insert, delete, etc. The Case tool allows upper and lower case letters, numbers, or symbols. Note: using all upper case yields the best results.
 - e. The wallplate/receiver zone outputs are numbered 1- 6 on each output level, the first level being the AVX-562 outputs. The AVX-562 outputs are always addressed “A” and the next level, Model 1176 should be “B” and so on. An individual zone output is referred to as A2, or B5, etc.

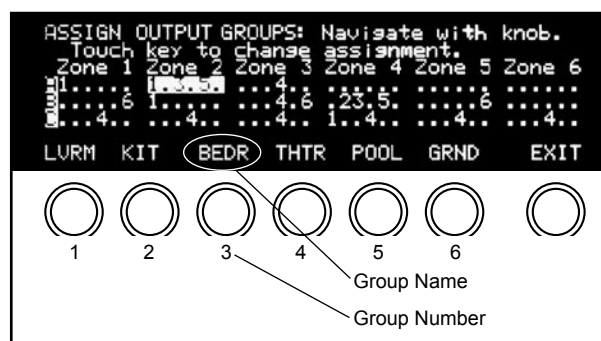
2. Custom Setup Highlights

- a. Settings. These options are convenient if the AVAtrix will be located in a visible area or around children. Lock certain front panel controls or allow the display to turn off during times of inactivity.
- b. Name the Sources. Especially for installations where the AVAtrix is used as a stand-alone whole house entertainment network, custom source names greatly enhance the usability of AV equipment within sight of the AVAtrix screen. Choose from a list of default names or enter custom names. These names appear prominently on the AVAtrix screen.
- c. Learn IR Commands. The AVAtrix can learn 3rd party IR commands. See the previous section on IR.
- d. Name the Groups. Enter names for output groups. Group View (from Professional Mode) displays a list of up to six named groups to the user and indicates which source is currently assigned to each group (see Operation). This view makes it easy to monitor and manage the content being shown on video displays in different rooms or areas from a central location. The number of groups is limited to six. Groups can contain any number or combination of zones, including the local zone.
- e. Assign Outputs to Groups. The groups you named are listed across the bottom of the screen. Navigate to the Zone address and touch the key for group names/numbers to which it should belong.



The text edit tools are indicated along the bottom of the screen: Case, Skip Back, Skip Forward, Overstrike/Insert, and Delete.

- f. Assign Restrictions. These controls allow the system administrator to prevent a zone from viewing a source. This operation is password protected (2-3-6). It is recommended to set up these restrictions via the PC Utility (page 18).
- g. Save/Load File. When all custom options are complete, save the setup to the flash card in case system settings are changed or lost. The card can be kept either in the AVAtrix or in some other safe location. A card could also be used to quickly set up similar AVAtrix systems installed in other locations. The Installer can keep a copy of each AVAtrix installation on a card for reference. To initialize a blank card, download the files from www.audioauthority.com/page/software, expand the zip archive, and copy the files onto the card.
- h. Diagnostics. See Appendix C for instructions on IR, addressing, and other diagnostics.



Group view offers control of zone groups by name, and can be used in six-zone systems to name the zones.

Setup Menu Chart

Settings

Lockout Front Panel Keys	Lockout all front panel keys except for Display and the key sequence for Setup Menu access.
Lockout Front Panel IR Detector	Detection ignores any IR commands visible from the front panel IR window; IR input jack on rear is still active.
Enable Display Blanking	Allows the front panel display to turn off after a period of inactivity.
Enable Feedback for Private Viewing	When enabled, this feature causes a brief break in the video signal as an indication that an "IR lock" or "view lock" signal has been implemented.

Name the Sources

Assign custom abbreviations and custom long names to each source.

Learn IR Commands

Teach the AVX-562 to respond to 3rd party IR commands.

Name Groups

Assign custom abbreviations and custom long names to each group of zones.

Assign Outputs to Groups

Divide the array of Cat 5 receiver outputs into geographic or functional zone "groups".

Assign Restrictions

Restrict source signals from particular zone wallplate/receivers

Save/Load File

Save Current Setup to Flash Card	Save the current setup configuration to memory card in rear slot. Does not overwrite any existing setup files.
Load New Setup from Flash Card	Scan and choose firmware upgrades from card or import setup data saved from an AVAtrix or saved from the AVAtrix PC application.
Load Demonstration Setup	Loads example setup including custom short and long source names and 24 simulated remote Wallplate locations.
Load Default Setup	Clears user setup and loads factory default setup.
Upgrade Operating System	Choose from available operating system firmware files on the flash memory card to install a firmware upgrade.

Contact Installer

Enter contact information. Up to four lines, 42 characters per line.

Diagnostics

Expander Address	Shows letter address of all detected expanders, including the six native AVX-562 Cat 5 matrix outputs.
Local IR	Shows on/off times of IR signals received through the front panel.
Zone IR	Shows on/off times and carrier of IR signals received through the Cat 5 wallplate/receivers.
Firmware Version	Shows the firmware version loaded on each component of the AVAtrix system, and the firmware upgrades available on a flash card loaded in the card slot.
Source and Control Restrictions	Shows the parental restrictions on sources to wallplate/receivers and local output.

PC Setup Via Flash Card

The AVAtrix Setup Utility is already loaded onto the flash memory card, or you can download it from www.audioauthority.com/page/software. Highlights of the PC Utility are covered here, but more information is available by clicking HELP inside the Utility.

1. Remove the flash card from the slot in the rear panel of the AVX-562 and insert it in an MMC/SD compatible card reader. The Utility should launch automatically in any Windows™ operating system.
 - a. Name of Configuration. Enter up to 32 characters to describe this configuration. This is the “label” that will be visible on the AVAtrix panel display when loading setup files. This name is not the same as the “filename.cfg” for this configuration as it will be saved onto the card.
 - b. Restriction Feedback for View-lock. When a user restricts the source, and restriction feedback is enabled, the video blinks to indicate that the command was implemented. If feedback is not enabled, the feature works without visible effect.
 - c. Enter Custom Source Names. These names are the “labels” shown on the AVAtrix panel display representing the six input positions. Short names may have up to four characters (letters, numbers, spaces or symbols). Full names may have 13 characters, and are visible in Residential and Group views.
 - d. Enter Custom Group Names. These names are the “labels” shown on the AVAtrix panel display representing each of the six available output zone groups (groups of wallplate/receiver locations). Short group Names may have up to four characters (letters, numbers, spaces or symbols). Full Names may have up to 13 characters.
 - e. Assign Zone Groups. Each group may contain any combination of wallplate/receivers from matrix routers, as well as the main output. Any zone may appear in more than one group.
 - f. Source Restrictions. Any source may be restricted from any wallplate/receiver. Under Zones, select the Cat 5 output address (Row A, B, C, etc.) and the zone (column) number. Then check any sources you wish to prohibit at this location. Select the next wallplate and proceed in the same way. To restrict a source from the Main output, simply check the Source number under Main.
2. The AVAtrix flash memory cards are issued with blank configuration files already saved onto the card, so you may overwrite these files, or save your file with a new file name; however, you must retain a .cfg extension on the filename. You may use a new blank card, but the card must have at least one configuration file saved to it by this application in order to function with the AVAtrix.
3. After saving the setup file (.cfg file), plug the flash card containing the setup file into the AVAtrix card slot.
4. Temporarily apply power, go to the SETUP menu, choose SAVE/LOAD FILE, choose the desired setup configuration file and follow the instructions on the screen. The 3-digit password is 2-3-6.

The screenshot shows the 'Editing: 11.cfg' window with the 'Source Names' tab selected. It contains a table for entering custom source names.

#	Short Name	Full Name
1	SAT1	DISH NETWORK
2	SAT2	DIRECT TV
3	CARD	ROKU FLASH
4	GAME	PLAYSTATION 2
5	DVD	SAMSUNG DVD
6	CABL	INSIGHT

The screenshot shows the 'Editing: 11.cfg' window with the 'Group Names' tab selected. It contains a table for entering custom group names.

#	Short Name	Full Name
1	LVRM	LIVING ROOM
2	KIT	KITCHEN
3	BEDR	KIDS ROOMS
4	THTR	THEATER ROOM
5	POOL	POOL & DECK
6	GRND	GROUND FLOOR

The screenshot shows the 'Editing: 11.cfg' window with the 'Groups' tab selected. It displays three columns: Zone Groups, Zones, and Main.

Zone Groups	Zones	Main
Group 1	<input checked="" type="checkbox"/> A1 - 01	<input checked="" type="checkbox"/> 01
Group 2	<input type="checkbox"/> A2 - 02	<input type="checkbox"/> 02
Group 3	<input type="checkbox"/> A3 - 03	<input type="checkbox"/> 03
Group 4	<input type="checkbox"/> A4 - 04	<input checked="" type="checkbox"/> 04
Group 5	<input type="checkbox"/> A5 - 05	<input type="checkbox"/> 05
Group 6	<input type="checkbox"/> A6 - 06	<input type="checkbox"/> 06
	<input type="checkbox"/> B1 - 07	
	<input checked="" type="checkbox"/> B2 - 08	
	<input type="checkbox"/> B3 - 09	

Operation

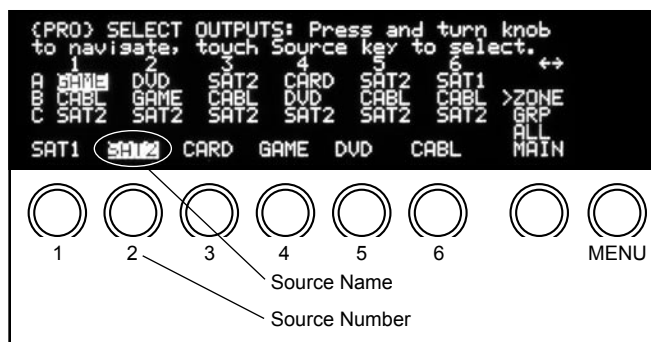
The AVAtrix allows you to select the source being played at each Cat 5 wallplate/receiver zone from the head end, and if the zone location is equipped with an infrared receiver, the source can be selected using an infrared remote control at the zone. Two operation screens are available: Residential and Professional. Use Professional mode to control the zones from the head end. Use Residential mode if the AVAtrix is visible at the local zone. To switch between Residential and Professional, press the front panel MENU key, or the DISPLAY key on the 1105BK remote control.

In Residential mode, the normal screen displays the custom long name of the selected source, the six short names of the sources, which of these sources is currently selected to the Main Output (highlighted short name).

The Professional screen displays the source currently assigned to each zone or group and allows you to choose a new source for each zone or group. A special group view is also available for a detailed overview of the sources assigned to each group.

In Professional mode, the ZONE screen displays the array of remote outputs. Along the bottom, it displays the six short names of the sources and which of these sources is currently selected to the MAIN (local) output (highlighted short name). To the right it displays the virtual MAIN, ALL and GRP modes.

In Group View (shown) it is simple to show the current source selected for each group. If some TVs in a group have a different source selected (e.g. Living room above) the AVAtrix places an asterisk by the source name displayed for that group.



Selecting a source in Professional Mode. Currently Source 2, which is Satellite Receiver #2, is selected on Cat 5 receiver (zone) A5.



Professional mode in Group view. (Not available if no groups are assigned.)

Head End Operation: Key Sequence Examples

The key sequences for several different operations using front panel controls or IR remote control are shown below. All examples assume the starting point is Professional Mode. To navigate using the front panel controls rotate the knob to move the cursor, press the knob to change directions when appropriate (up/down vs. left/right).

1105BK Remote Control (From Professional Screen)	
Changing the source on the local output	Double-click SOURCE; Press the desired number key or press the Left/Right SCAN keys.
Changing the source on a ZONE (Cat 5 receiver)	Press ZONE; use the up/down/left/right keys or Alpha key/Number key to highlight the zone; press the SOURCE key; press the Number key for the desired source. Example: Zone A1, Source 4, etc.
Changing the source for a group of zones	Press GROUP (if necessary); use the up/down keys to highlight the desired zone group; touch the Number key for the desired source. Example: Group 1, Source 2, etc.
Changing the source for all zones	Press ALL; press the Number key for the desired source. (Press ENTER to UNDO.)

AVatrix Front Panel Controls (From Professional Screen)	
Changing the source on the local (MAIN) output	Touch soft key until MAIN is highlighted; touch the desired source input selection key or turn the knob.
Changing the source on a ZONE (Cat 5 receiver)	Turn the knob to navigate, press the knob to change directions; when the desired zone is highlighted, touch the desired source input selection key.
Changing the source for a group of zones	Touch soft key until GRP is highlighted; turn the knob to select the desired group; touch a source input selection key to assign a source.
Changing the source for all zones	Touch soft key until ALL is highlighted; touch the desired source input selection key to assign a source. (Press the knob to UNDO.)

Remote Zone Operation: Key Sequence Examples

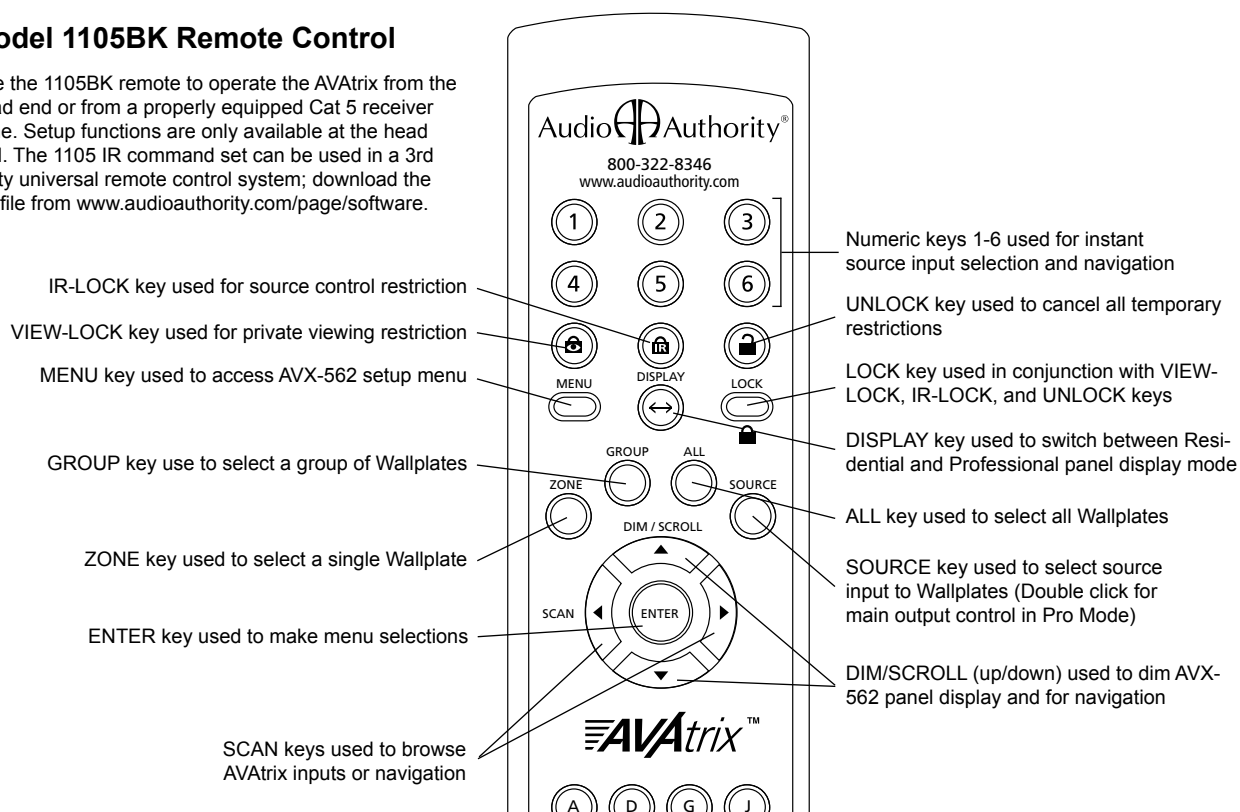
The key sequences for several operations using the 1105BK IR remote control from the Cat 5 wallplate/receiver zone are shown below. The zone must be equipped with a compatible IR receiver.

View-lock and IR-lock timeout after 300 minutes. These commands can be temporarily suspended using the Source and Control Restrictions Diagnostic Mode.

Changing the source on the zone output	Press the desired source number key.
Activate VIEW LOCK (private viewing)	Press LOCK, then press VIEW LOCK. No other zones can select the source selected at this zone, and zones viewing this source are locked out. (Expires after 300 minutes.)
Activate IR LOCK	Press LOCK, then press IR LOCK. No other zones can change settings (channels, etc) through the AVatrix IR pathway. (Expires after 300 minutes.)
Clear all LOCK commands	Press LOCK, then UNLOCK.

Model 1105BK Remote Control

Use the 1105BK remote to operate the AVatrix from the head end or from a properly equipped Cat 5 receiver zone. Setup functions are only available at the head end. The 1105 IR command set can be used in a 3rd party universal remote control system; download the ccf file from www.audioauthority.com/page/software.



Appendix A: Troubleshooting

Symptom Causes and Solutions

Flashing POWER LED on Expander	<ul style="list-style-type: none">• Improperly terminated Cat 5 cables – Use professional cable tester and re-apply cable ends• Bad power supply – Install new supply• Damaged Cat 5 receiver – Disconnect all Cat 5 cables and observe POWER LED• Bent pins on internal bus cable connector – Call Audio Authority for assistance
No video or IR control after adding expanders	<ul style="list-style-type: none">• Incompatible firmware versions – Upgrade to latest firmware (see www.audioauthority.com)• Improperly seated internal bus cable – Check connection
No video or audio	<ul style="list-style-type: none">• Improperly terminated Cat 5 cables – Use professional cable tester and re-apply cable ends• Improperly seated internal bus cable – Check connections• Damaged Cat 5 port on AVAtrix – Try Cat 5 cables on a different port• Damaged Cat 5 receiver – swap with known good receiver
1176 or 1172 Expanders not recognized	<ul style="list-style-type: none">• Improperly seated internal bus cable – Check connections• Incompatible firmware versions – Upgrade to latest firmware (see www.audioauthority.com)• Incorrect address setting – Set correct expander address (see page 8 or see 1172 manual)• Damaged Address Dial – Use Expander Diagnostic (see Appendix C) to check settings and functionality
IR does not function properly	<ul style="list-style-type: none">• IR interference such as LCD/Plasma screen, fluorescent lights, space heater, sunlight• Eliminate sources of IR interference and use Plasma-proof and/or LCD-proof IR receivers• Experiment with relocating the IR receiver• Check for IR interference using the IR diagnostics• Incompatible IR receivers – use only 12 volt, three-wire receivers (see page 14)• Improperly terminated Cat 5 cables – Use professional cable tester and re-apply cable ends• Improperly seated internal bus cable – Check bus cable connections <p>Note: 1105 and 1105BK IR commands sent from wallplate/receiver IR ports are not passed to any of the AVAtrix IR Output jacks.</p>
Does not respond to a learned IR command	<ul style="list-style-type: none">• Wrong IR code learned or IR remote cannot be learned• Note: AVAtrix “learned commands” do not work with wallplate/receiver zones
Does not respond to RS-232	<ul style="list-style-type: none">• AVAtrix commands not stored in remote control system (see Appendix D)• Wrong type of RS-232 cable• Incorrect settings in software
Does not repeat commands from a certain IR remote	<ul style="list-style-type: none">• Some IR remotes cannot be processed by the AVAtrix• IR output not properly connected to external IR system – call Audio Authority Technical Support

Appendix B: Upgrading the AVAtrix Operating System Firmware

The latest version is available to download to your PC from www.audioauthority.com/page/software.

1. Place the AVAtrix flash card containing the latest operating system data into the AVAtrix card slot.
2. Press the knob and touch MENU. The setup menu appears. Scroll and choose “Save/Load File”.
3. Scroll and choose “Upgrade Operating System.” The upgrade screen appears.
4. Touch, in order, 2-3-6 then “Load” (or 1).
5. Scroll and select the latest operating system (e.g. May 27th, 2008).

After you select the version you want the screen displays “Downloading...” This step takes from one to several minutes. After the screen displays “Completed” the AVAtrix reboots several times.

Appendix C: How to Use Diagnostic Modes

To access diagnostic modes, enter Setup Menu (press the knob and touch MENU) and select DIAGNOSTICS at the bottom of the menu.

Expander Address Diagnostic

This diagnostic can be used to determine whether all of your AVAtrix expanders are set to the correct address. Enter this diagnostic mode and then turn the address dial on the rear of each expander until the “X” on the screen is under the correct address. The AVX-562 has an 1176 inside the chassis that is addressed “A”. If A does not appear on the diagnostic screen, the internal bus cable may be loose. The Model 1170 does not have an address or address dial.

Firmware Version Diagnostic

This diagnostic shows what firmware version resides in each expander in the AVAtrix network, as well as what firmware upgrade versions may be stored on the flash card in the AVAtrix card slot. This information helps to determine if the AVAtrix needs a firmware upgrade or if all processors in the system have been successfully upgraded.

Local IR Diagnostic

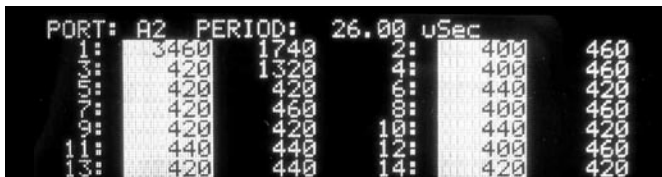
This diagnostic shows the raw on/off times of the encoded IR signals coming from any remote (other than the 1105) pointed at the front panel IR window of the AVAtrix. This diagnostic shows the “bit times” only and does not show carrier frequency information. The first command in the test may result in zeros, so press the button twice to get a useful readout.

Zone IR Diagnostic

This diagnostic shows the raw on/off times of the encoded IR signals coming from any Cat 5 wallplate/receiver. It shows the “bit times” as well as the period of the IR carrier. Dividing one (1) by the number of microseconds shown on the screen results in the detected carrier frequency (see example below). This diagnostic is very helpful for troubleshooting IR response issues in an AVAtrix system.

“Waiting for I/R data from wallplate” appears on the entry screen of this diagnostic. Watch this screen to indicate IR interference from a Plasma TV or other ambient conditions. Do not press any buttons on IR remote controls during the test. If any other message appears during the test, IR interference is present. Go to a wallplate/receiver location and press a button on a source unit IR remote (not the 1105BK). The first command in the test may result in zeros, so press the button twice to get a useful readout.

The AVAtrix screen shows details similar to the example above. The top line shows the zone from which the command originated and the period of the IR carrier. To determine the detected carrier frequency, divide the number on the screen by 1,000,000. Then divide one (1) by the resulting number.



PORT: A2		PERIOD: 26.00 uSec			
1:	3460	1740	2:	400	460
3:	420	1320	4:	400	460
5:	420	420	6:	440	420
7:	420	460	8:	400	460
9:	420	420	10:	440	420
11:	440	440	12:	400	460
13:	420	440	14:	420	420

In this example, the command came from port two on 1176 “A”. The period of the carrier is 26 microseconds. Divide 26 by 1,000,000 to get .000026. Then divide one (1) by .000026 to get a carrier frequency of 38.461kHz. Each decimal number is a “burst pair” in the IR data train. The first signal in this remote command turns the carrier on for 3.460 milliseconds and off for 1.740 milliseconds. The second command was on for 400 microseconds and off for 460 microseconds. Use this information to see what data the remote is sending out and if it looks correct. Zeros, or numbers that don’t show any perceptible pattern may indicate interference.

Source and Control Restrictions Diagnostic

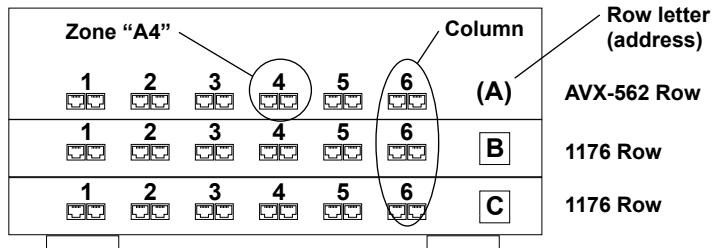
All restrictions can be monitored and temporarily suspended from this screen. The initial screen shows the sources that currently have permanent restrictions (R) and View-lock or IR-lock restrictions with time remaining. Touch PAGE to see details on each source’s restriction status at each zone. Touch ALLOW ALL to temporarily suspend all restrictions for troubleshooting purposes. Restrictions are restored upon exit of this diagnostic.

Appendix D: RS-232 Serial Protocols

Model AVX-562, and 1176 expanders can be controlled via RS-232 from a PC or dedicated controller. Two different RS-232 serial protocols are available; the Abbreviated Command Set is simple, and one-way, and the Extended Command Set has more commands and reports all system changes through the serial port, regardless of the origin of the command. Use commands from either or both protocols.

Specifications

The RS-232 control port on the AVAtrix is fixed at 9600 baud. There is no provision for flow control (XON/XOFF, DTR, etc.). On power up, the AVAtrix echoes any received character, but that echo function may be turned off as described at the end of this section to prevent corruption of replies.



Transfer Rate	9600 bps
Data Bits	8
Stop Bits	1
Parity	None
Flow Control or Data Flow	None
Character type	ASCII
Interface connector	DB-9
Electrical rating	Pins 2 and 3, ±15 VDC
Pin out	Pin 2, Tx
	Pin 3, Rx
	Pin 5, Ground
	Shell, Ground
Null modem cable	Call Audio Authority

About Address Terminology

A “row” or row letter refers to a six-output array, either the internal Cat 5 outputs on the AVX-562 or an 1176 expander. The AVX-562 row is always addressed “A” and other 1176 expanders should be addressed in order as shown above. “Column” refers to the zone number as labeled on the AVAtrix or 1176 expander.

General Commands (Abbreviated)

These commands can be used at any time during operation of the AVAtrix to change the state of selected settings. NOTE: Alpha characters are not case-sensitive. ASCII codes not specified are ignored (i.e. control codes, unused alphanumeric characters, etc.).

Command	Description
P	Select Professional screen
R	Select Residential screen
V-	Unlock front panel controls
V+	Lock front panel controls
W-	Unlock front panel optical IR receiver
W+	Lockout front panel optical IR receiver
Y-	Disable display blanking
Y+	Enable display blanking

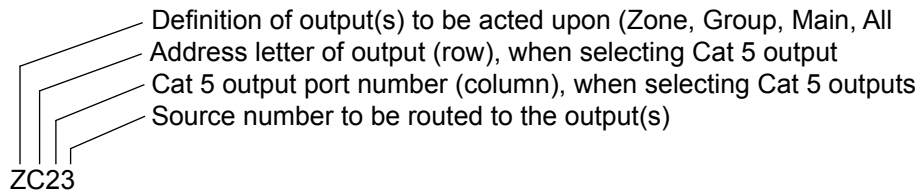
Source Selection Commands (Abbreviated)

Assign or change input sources to the AVAtrix main (local) output, any individual Cat 5 zone output, zone groups, or all zones. In the “Command” column below, actual commands are shown in upper case, and variables are represented by lower case bold characters (commands are not case-sensitive).

Command	Name	Description	Variables
Zwxy	Select Zone	Assign Source y to an individual zone wx	w = Row A-L (AVX-562 Cat 5 array or 1176) x = Column 1-6 (output number) y = Source 1-6 g = Group 1-6
Gzy	Select Group	Assign Source y to all zones in a group z	
Xy	Select All	Assign Source y to all zones	
My	Select Main	Assign Source y to the AVAtrix local (main) output	

Abbreviated Command Examples

The general format of commands is as follows:



Example 1. To route source input 3 to the main AVAtrix output, send the following command:

M3 (The AVAtrix selects source 3 to its main output)

Example 2. To change the source assigned to an individual zone, enter “Z” followed by the letter of the row, followed by the number of the column (zone number) from 1 to 6, followed by the number of the source input from 1 to 6. To assign source input 5 to the 2nd Cat 5 zone on the “C” row (second 1176 expander), send the code:

ZC25 (Source 5 is selected to zone C2)

Example 3. To assign the same input source to all the zones, send the following command:

X4 (All Cat 5 zones output source 4)

Example 4. To change the source to an entire zone group, enter “Z” followed by the group number, followed by the desired source input number. To assign source 3 to group 2, enter the code:

G23 (All zones in group 2 play Source 3)

NOTE: If zone groups have not been assigned, no action results from this command.

Query Commands and Responses

Retrieve the status of any part of the AVAtrix system using the query commands. A query command sent by the controller will elicit a response according to the following table.

Command	Name	Response	Variables
?P or ?R	Screen Mode	P if display is in professional screen R if display is in residential screen S if display is in any other screen (e.g. Setup)	w = Row A-L (AVX-562 Cat 5 array or 1176) x = Column 1-6 (output number)
?V	Panel Controls	– if panel controls are unlocked + if panel controls are locked	
?W	Panel IR Receiver	– if IR receiver is unlocked + if IR receiver is locked out	
?M	Main Output	Number of selected source	
?Zwx	Cat 5 Output	Number of source selected by wallplate/receiver wx	

Extended Command Set

All valid commands receive a response, and all changes in the AVAtrix system are reported. In the “Command” column on the next page, actual commands are shown in upper case, and variables are represented by lower case bold characters (commands are not case-sensitive).

Command Definitions (Extended)

Command: String received by the AVAtrix from the controlling hardware. Commands are not case sensitive and should be 8-bit with No parity. The only characters recognized are: letters (**a-z** and **A-Z**), numbers (**0-9**), brackets (**[** and **]**), signs (**+** and **-**), and the question mark (**?**). All other characters, including spaces and commas, are optional and may be either included for clarity or omitted entirely.

Response: String transmitted by the AVAtrix to the controlling hardware. Responses are 8-bit with no parity. Responses are transmitted as noted below, and always have a **C/R L/F** sequence (0x0d, 0x0a) after each line.

Query: A special command that requests the current status of one or more connections or settings, but does not change any operation within the AVAtrix. A query must always contain the **?** question mark character.

Parameters: Values contained within commands and responses which identify groups, sources, zones, and router devices.

j: group in range {1-6}

m: source in range {1-6}

n: zone in range {1-6}

x: A/V router device in range {A-L}

In this document, braces **{** and **}** are used to signify ONE of the enclosed characters. For example, **{L,U}** would mean either of the two characters **L** or **U**.

General Commands (Extended)

Command:	Response:	Description:
[C,M,Im]	(M,Im)	Connect main output to source m
[C,Rx,On,Im]	(Rx,On,Im)	Connect zone n of A/V router x to source m
[C,X,Im]	(X,Im)	Connect all zones on all A/V routers to source m
[C,Gj,Im]	(Gj,Im)	Connect all outputs in group j to source m
[L,P]	(P,L)	Lock out front panel controls
[U,P]	(P,U)	Unlock front panel controls
[L,I]	(I,L)	Lock out internal I/R receiver
[U,I]	(I,U)	Unlock internal I/R receiver
[+,B]	(B,+)	Turn on display blanking after 45 seconds of inactivity
[-,B]	(B,-)	Turn off display blanking
[+,P]	(P,+)	Select Professional Screen
[-,P]	(P,-)	Select Residential Screen

Query Commands (Extended)

Query:	Response:	Description:
[?,C,Rx,On]	(Rx,On,Im)	Query unit connection
[?,C,M]	(M,Im)	Query main connection
[?,C,X]	see below	Query all connections
[?,{L,U},P]	(P,{L,U})	Query status of panel lockout
[?,{L,U},I]	(I,{L,U})	Query status of internal I/R lockout
[?,{L,U},A]	(A,{L,U})	Query status of AutoSelect lockout
[?,{+,-},B]	(B,{+,-})	Query status of Display blanking
[?,{+,-},P]	(P,{+,-})	Query status of Display Screen
[?,{+,-},A]	(A,{+,-})	Query status of AutoSelect function

Any command not in the Extended Command Set which begins with a left bracket [and ends with a right bracket] is an invalid command and the AVAtrix responds with the string **(ERROR)**.

Response to [?,C,X] :

(RA,O1,Im)(RA,O2,Im)(RA,O3,Im)(RA,O4,Im)(RA,O5,Im)(RA,O6,Im)
 (RB,O1,Im)(RB,O2,Im)(RB,O3,Im)(RB,O4,Im)(RB,O5,Im)(RB,O6,Im)
 ... through all devices ...
 (M,Im)

Power Up, Extended Commands and Their Effect on Echo Function

On power up, the AVAtrix sends the string **(RESET)**. The AVAtrix also echoes any data received on the RS-232 port. If any valid normal command is received (beginning and ending with brackets [and]), the AVAtrix ceases echoing characters to prevent these echoed characters from corrupting responses. The echo function remains off until the AVAtrix is reset, either by interrupting power or by double-pressing the front panel button.



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